HYDRAULIC BRAKE TROUBLE SHOOTING

BRAKE INSPECTION & TESTING

Inspect brakes at frequent intervals for pedal reserve (clearance between pedal pad and toeboard with pedal firmly depressed, while brakes are cold). Increase pedal reserve by adjusting brake shoe to drum clearance. Brakes should be tested on dry, clean, reasonably smooth, level roadway (not with wheels jacked up). Test at different speeds both with light and heavy pressure. *CAUTION — Do not lock wheels and slide tires on roadway.*

CONDITIONS AFFECTING BRAKE PERFORMANCE

Same size tires on each side of car with approximately same tread design. Wheels equally loaded (more heavily loaded wheels require more braking power). Front wheel bearings properly torqued. Front end out of alignment (particularly camber and king pin inclination). Faulty shock absorbers. Linings must be properly fitted to drums and properly installed on backing plate.

TROUBLE SHOOTING DRUM BRAKES

LOW PEDAL OR EXCESSIVE TRAVEL

Brake shoe clearance excessive. Low fluid level. Air in system. Fluid leak. Master cylinder internal leak. Improper brake fluid. Automatic adjusters inoperative. Plugged master cylinder filler cap.

SPONGY PEDAL

Air in system. Improper brake fluid. Improper lining thickness or location. Drums worn too thin. Master cylinder vent clogged.

BRAKES GRAB

Front wheel bearings loose. Backing plate loose. Excessive dust in brakes. Charred lining or scored drums. Grease or brake fluid on lining. Primary and secondary lining reversed. Improper adjustment. Lining loose on shoe.

HARD PEDAL

Shoe anchor pins improperly adjusted. Grease or fluid on linings. Improper brake lining or fluid. Pedal linkage binding. Swollen cylinder cups. Cylinder pistons sticking. Glazed linings. Drum scored or out-of-round. Faulty master cylinder check valve.

ONE WHEELS DRAGS

Front wheel bearings loose. Shoes adjusted too tight. Shoe return spring broken or weak. Piston stuck or cups distorted. Clogged line or hose. Drum out-of-round. Loose anchor pin. Distorted shoe. Defective lining.

REAR BRAKES DRAG

Improper adjustment. Parking brake cable frozen.

ALL WHEELS DRAG

Shoes adjusted too tight. Master cylinder compensating hole clogged. Wheel cylinder cups distorted. Incorrect adjustment on master cylinder push rod. Master cylinder push rod or linkage binding. Swollen cylinder cups. Power unit internal springs weak or broken. Power unit rubber cups and "O" ring seals dry.

CAR PULLS TO ONE SIDE

Unevenly matched tire treads. Anchor pins incorrectly set. Shoes improperly fitted to drums (partial drum contact), on vehicles with non-adjustable anchors. Front wheel bearings loose. Drums out-of-round or scored. Improper lining. Foreign matter on lining. Brake dragging. Weak chassis springs or "U" bolts. Loose steering. Unequal camber. Clogged or crimped line. Loose king pins or bushings.

BRAKES SQUEAK OR NOISY

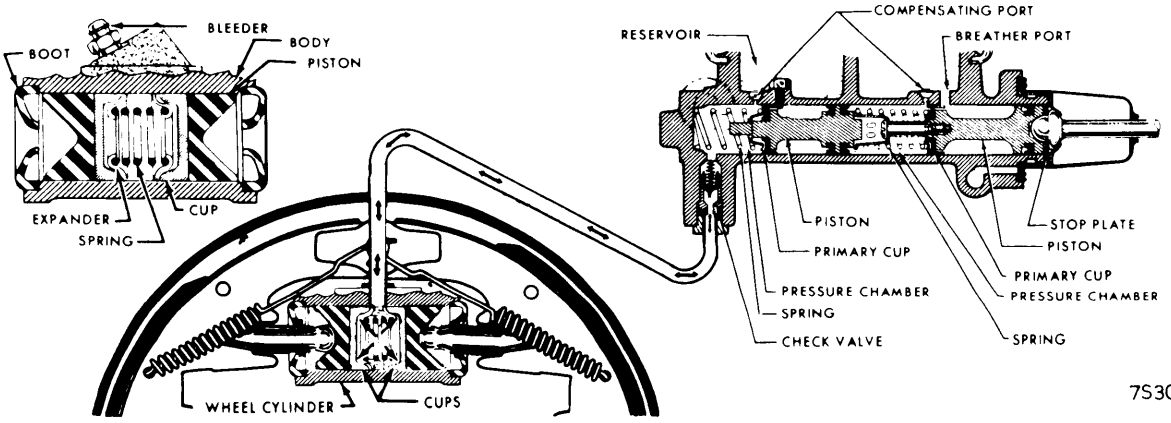
Shoes improperly adjusted. Drums out-of-round, scored, or cracked. Foreign material in lining. Lining loose on shoe. Bent backing plate. Improper lining. Shoes scraping backing plate. Loose front wheel bearings. Wheel cylinder cups swollen, distorted, or stuck. Weak or broken return springs. Loose anchor pin.

BRAKES FADE (FAIL TO HOLD)

Excessive heat build-up. Improper linings. Drums too thin. Lining soaked with fluid or oil. Improper fluid.

PULSATING BRAKE PEDAL

Drums out-of-round. Loose brake drum. Worn or loose bearings. Bent rear axle.



HYDRAULIC BRAKE SYSTEM (TYPICAL)

HYDRAULIC BRAKE TROUBLE SHOOTING (Cont.)

BRAKES CHATTER

Improper shoe adjustment. Loose backing plate. Foreign material on lining. Weak or broken return spring. Loose wheel bearings. Drum out-of-round. Distorted or misaligned shoes. Frozen strut rod bushings.

SNAPPING NOISE IN FRONT END

Grooved backing plate pad. Lack of lubrication on moving parts. Loose drums or backing plate. Loose or worn front end parts. Defective lining.

POWER BRAKE UNIT DOES NOT BOOST

Test For Power Unit Operation – Stop engine and apply pedal pressure several times to remove all vacuum from system. Hold pressure on pedal and start engine. Pedal will move slightly forward when cylinder is operating.

Power Unit Does Not Operate – Vacuum check valve stuck closed. Vacuum pipe bent, broken, or clogged. Blocked air inlet. Air valve sticking in diaphragm.

Power Unit Operating; Braking Action Abnormal – Fluid low. Glazed, dirty, or oily linings.

TROUBLE SHOOTING DISC BRAKES

LOW PEDAL OR EXCESSIVE TRAVEL

Fluid low. Improper brake fluid. Air in system. Hoses expand under pressure. Disc runout excessive. Wheel bearings or steering parts loose. Shoe and lining knockback after violent cornering or rough road travel. Improper rear brake adjustment. Distorted shoes or linings. Damaged caliper piston seal. Master cylinder or power unit malfunction. Metering valve (for front brakes) not working. Piston and shoe assembly misaligned. Caliper seals soft or swollen.

PEDAL APPLIED; NO BRAKING ACTION

Air in system. Leak past primary cup in master cylinder. Piston pushed back into bores. Hydraulic leak. Rear brakes out of adjustment.

HARD PEDAL

Master cylinder or power unit malfunction. Brake fluid, oil, or grease on linings. Lines or hoses kinked, dented, or collapsed. Cylinder cups swollen. Linings worn. Incorrect lining. Frozen or seized pistons. Metering valve or cylinder bores corroded. Pedal linkage binding.

PULLING OR GRABBING

Pads contaminated with brake fluid, oil, or grease. Caliper loose or out of alignment. Lines or hoses dented, kinked, or clogged. Master cylinder bore corroded. Caliper piston frozen. Caliper cylinder seals swollen or soft. Caliper cylinder bores corroded. Pedal linkage binding. Metering valve (in line to front wheels) malfunctioning. Lining surface charred from fast break-in. Piston scored or corroded. Power unit malfunction. Broken rear spring. Disc out-of-round. Improper rear brake adjustment. Distorted disc pads. Improper tire pressure. Front end out of alignment. Rear drums out-of-round.

PEDAL GOES SLOWLY TO FLOOR

Air in system. Hoses or lines soft (expand under pressure) or damaged. Master cylinder primary cup damaged, bore worn, or corroded. Improper fluid. Bleeder screw open.

NOISE, CHATTER, OR PULSATION

Excessive disc runout. Disc pads or disc out of parallel (thickness varies). Shoe and lining knockback after violent cornering (pump pedal to correct). Excessive clearance between disc pad and caliper. Anti-rattle retainer missing or out of position. Disc pad rubbing caliper housing. Caliper binding on mounting bolts. High-frequency chatter of pads against disc. Rear drums out-of-round. Wheel bearings loose. Improper wheel nut tightening. Caliper mounting bolts too long.

DRAGGING BRAKES

Lines or hoses dented, kinked, or clogged. Master cylinder compensating port clogged or blocked by swollen primary cup. Residual pressure valve installed in master cylinder (no valve used with disc brakes). Pistons frozen. Swollen cylinder seals. Caliper cylinder bores corroded. Power unit push rod out of adjustment. Sticking pedal linkage. Metering valve (in line to front wheels) not working. Power unit check valve faulty.

BRAKE SERVICING

See following article for brake bleeding instructions. See separate brake articles for brake shoe and brake pedal adjustments.